



2019 Astrophysics Explorers Mission of Opportunity Evaluation Plan

**Third Stand Alone Missions of Opportunity
Notice Announcement of Opportunity
NNH17ZDA004O,
Program Element Appendix O
May 7, 2019**



Outline

Astrophysics
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2019 Astrophysics Explorers PEA O Evaluation Plan



Introduction

This package includes the Third Stand Alone Mission of Opportunity Notice (SALMON-3) Announcement of Opportunity (AO) NASA Science Mission Directorate (SMD) Evaluation Plan and the 2019 Astrophysics Explorers Program Element Appendix (PEA) O Evaluation Plan.

The SALMON-3 AO is an omnibus solicitation for Principal Investigator (PI)-led Missions of Opportunity (MOs) that is updated by PEAs. The SALMON-3 AO NASA SMD Evaluation Plan covers the evaluation information from the SALMON-3 AO and from the NASA SMD evaluation processes conducted by the Science Evaluation Panel and Technical Management and Cost (TMC) Evaluation Panel. The “SALMON-3 AO Evaluation Plan” designation in the top right hand corner of a slide indicates that the information refers to the SALMON-3 AO NASA SMD Evaluation Plan.

The 2019 Astrophysics Explorers PEA O Evaluation Plan covers any updates to the evaluation information from SALMON-3 AO and from the NASA SMD evaluation processes that will be conducted by the Science Evaluation Panel and TMC Evaluation Panel. The “Astrophysics Explorers PEA O Evaluation Plan” designation in the top right hand corner of a slide indicates that the information refers to the 2019 Astrophysics Explorers PEA O updates.



Third Stand Alone Missions of Opportunity Notice Announcement of Opportunity NNH17ZDA0040

NASA Science Mission Directorate Evaluation Plan



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Introduction

The Third Stand Alone Missions of Opportunity Notice (SALMON-3) Announcement of Opportunity (AO) NASA Science Mission Directorate (SMD) Evaluation Plan covers the evaluation information from the SALMON-3 AO, which is the omnibus solicitation that is updated by each Program Element Appendix (PEA), and from the NASA SMD evaluation processes conducted by the Science Evaluation Panel and Technical, Management, and Cost (TMC) Evaluation Panel.

The Evaluation Plan for a specific PEA is found in the PEA-specific Acquisition Homepage.



SALMON-3 AO Compliance Checklist: Appendix F



Compliance Checklist

SALMON- 3 AO
Evaluation Plan

Checklist with the list of items that NASA checks for compliance before releasing a proposal for evaluation. All other requirements are checked during evaluation.

Administrative:

1. Electronic proposal received on time
2. Proposal on CD_ROMs received on time
3. Original signatures of PI and of authorizing official included
4. Meets page limits
5. Meets general requirements for format and completeness (maximum 55 lines text/page, maximum 15 characters/inch – approximately 12 pt. font, 1 inch margins)
6. Required appendices included; no additional appendices
7. Budgets are submitted in required formats
8. All individual team members who are named on the cover page indicate their commitment through NSPIRES
9. All export-controlled information has been identified
10. Complied with restrictions Involving China

Science, Exploration, or Technology:

11. Addresses solicited science, exploration, or technology programs
 12. Requirements traceable from objectives to mission
-



Compliance Checklist

SALMON- 3 AO
Evaluation Plan

-
13. Plan to calibrate, analyze, publish, and archive the data returned
 14. Baseline Investigation and Threshold Investigation defined

Technical:

15. Complete spaceflight mission (Phases A-F) proposed
16. Team led by a single PI (Principal Investigator)
17. PI-Managed Mission Cost within the PEA-specific Cost Cap (if a PEA-specific Cost Cap is stated in the applicable PEA)
18. Contributions within contribution limit (if PEA specifies a contribution limit)
19. Co-Investigator costs in budget
20. Launch/Commitment date prior to launch deadline (if PEA specifies a deadline)
21. Includes table describing non-U.S. participation
22. Includes letters of commitment from funding agencies for non-U.S participating institutions
23. Includes letters of commitment from all U.S. organizations offering contributions
24. Includes letters of commitment from all major partners and non-U.S. institutions providing contribution of efforts of anyone on the Proposal Team.

Note: SALMON-3 Section 5.9.1.2 states “Major partners are the organizations, other than the proposing organization, responsible for providing research leadership, project management, system engineering, major hardware elements, science instruments, integration and test, mission operations, and other major products or services as defined by the proposer.”



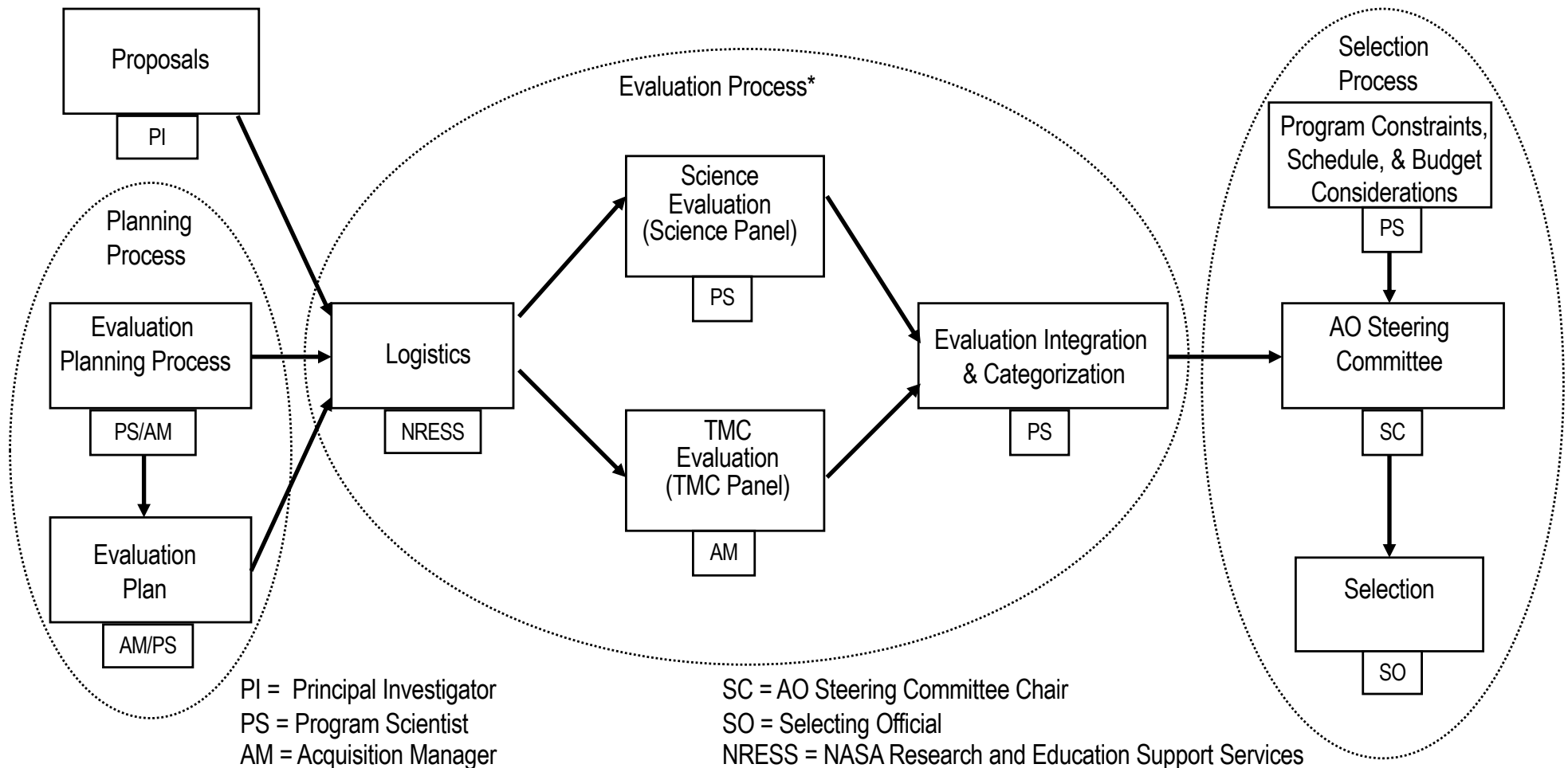
SALMON-3 AO NASA SMD Evaluations: General



SALMON-3 AO Evaluations

SALMON-3 AO Evaluation Plan

NASA SMD Processes and Responsibilities



* The Evaluation Process is addressed in this document.



SALMON-3 AO Evaluations

SALMON- 3 AO
Evaluation Plan

Conflict of Interest Prevention Requirements

- NASA Research and Education Support Services (NRESS) cross-checks all the Science Panel members against the lists of personnel and organizations identified in each proposal submitted to determine whether any organizational Conflict of Interest (COI) exists.
- The NASA Science Office for Mission Assessments (SOMA) support contractor cross-checks all TMC Panel members against the lists of personnel and organizations identified in each proposal submitted to determine whether any organizational COI exists.
- All evaluators must divulge any other financial, professional, or potential personal COI, and whether they work for a profit-making company that directly competes with any profit-making proposing organization.
- All Civil Service evaluators must self certify confirming that no COI exists.
- The TMC evaluators must notify the NASA SOMA Acquisition Manager, in case there is a potential COI. The Science evaluators must notify the Program Scientist, in case of a potential COI.



SALMON-3 AO Evaluations

SALMON- 3 AO
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Conflict of Interest Prevention Requirements

- All known conflict of interest issues are documented and a COI Mitigation Plan is developed to minimize the likelihood that an issue will arise in the evaluation process. Any potential COI issue is discussed with the Program Scientist and the NASA SMD Deputy Associate Administrator for Research and documented in the COI Mitigation Plan. All determinations regarding possible COIs that arise will be logged as an appendix to the COI Mitigation Plan.
- If any previously unknown potential COI arises during the evaluation, the conflicted member(s) will be notified to stop evaluating proposals immediately, and the Panel Chair will be notified immediately. If a COI is confirmed, the conflicted member(s) will be immediately removed from the evaluation process, and steps will be taken expeditiously, to remove, mitigate, or accept any actual or potential bias imposed by the conflicted member(s). The steps will be documented in the COI Mitigation Plan.
- Members of the Science and TMC panels are prohibited from contacting anyone outside their panel for scientific/technical input, or consultation, without the prior approval of the Program Scientist.



SALMON-3 AO Evaluations

SALMON- 3 AO
Evaluation Plan

Proprietary Data Protection Requirements

- All proposal and evaluation materials are considered proprietary.
- Viewing of proposal materials are only on a need-to-know basis.
- Each evaluator signs a Non-Disclosure Agreement (NDA) that must be on file at NRESS prior to any proposals being distributed to that evaluator.
- The proposal materials that each evaluator has access to is recorded.
- Evaluators are not permitted to discuss proposals with anyone outside their Science or TMC Panel.
- All proprietary information that must be exchanged between evaluators will be exchanged *via* the secure NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES), *via* the secure Remote Evaluation System (RES), secure WebEx or *via* encrypted email, FedEx, fax, or regular mail. Weekly Web conferences among TMC Panel evaluators will be conducted *via* secure lines.
- Evaluators' electronic and paper evaluation materials will be deleted/destroyed when the evaluation process is complete. Archival copies will be maintained in the NASA SOMA vault.



SALMON-3 AO Evaluations

SALMON- 3 AO
Evaluation Plan

Principles for Evaluation

- All proposals are to be treated fairly and equally.
- Merit is to be assessed on the basis of material in the proposal and clarification process (if applicable).
- Evaluation Ratings reflect the written strengths and weaknesses.
- Everyone involved in the evaluation process is expected to act in an unbiased objective manner; advocacy for particular proposals is not appropriate.

General Evaluation Ground Rules

- All proposals are evaluated to uniform standards established in the solicitation, and without comparison to other proposals.
- All evaluators are experts in the areas that they evaluate.
- Non-panel/mail-in evaluators (to provide special science expertise to the Science Panel) and specialist evaluators (to provide special technical expertise to the TMC Panel) may be utilized, respectively, based on need for expertise in a specific science or technology/engineering area that is proposed.



SALMON-3 AO Evaluations

SALMON- 3 AO
Evaluation Plan

Evaluation Criteria and Selection Factors

Evaluation Criteria from Section 7.2 of the SALMON-3 AO:

1. Intrinsic Science, Exploration, or Technology Merit of the Proposed Investigation (Evaluated by the Science Panel);
2. Experiment Science, Exploration, or Technology Implementation Merit and Feasibility of the Proposed Investigation (Evaluated by the Science Panel);
3. TMC Feasibility of the Proposed Investigation Implementation (Evaluated by the TMC Panel).

Weighting: the first criterion is weighted approximately 40%; the second and third criteria are weighted approximately 30% each.

Other Selection Factors from Section 7.3 of the SALMON-3 AO:

- Programmatic factors
 - PI-Managed Mission Cost
-



Science Evaluation



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Composition and Organization

- The Program Scientist leads the Science Panel.
 - Science evaluators are typically, but not exclusively, recruited from the academic, governmental, and industrial research communities.
 - The Science Panel evaluates the Intrinsic Science Merit of the Proposed Investigation and the Experiment Science Implementation Merit and the Feasibility of the Proposed Investigation.
 - The science evaluation is conducted *via* one Science Panel, however sub-panels may be employed, depending on the number and variety of proposed investigations.
 - Any sub-panel is led by a NASA Civil Servant and may be co-chaired by a member from the scientific community.
 - Sub-panels may have an Executive Secretary.
 - Each proposal is evaluated by assigned panel members.
 - The Lead Evaluator for each proposal leads the discussion.
 - The Lead Evaluator may assign another Evaluator to take notes on the discussion.
 - The TMC Panel may provide comments and questions to the Science Panel.
-



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Procedures

Each Science Panel member evaluates proposals as directed by the Chair.

- If special science expertise is required, the Science Panel may utilize non-panel/mail-in evaluators to assist with one or more proposals.
- Non-panel/mail-in evaluators evaluates only those parts of proposals pertinent to their scientific specialties.

Each proposal may be discussed by the evaluators in teleconferences.

- Findings in the form of Strengths and Weaknesses form the basis for initial panel discussions.
- Each panel member provides an individual evaluation prior to the teleconference.
- During the teleconference, proposals and the individual evaluations including non-panel/mail-in evaluations are discussed.
- Following the teleconference, the Lead Evaluator captures/synthesizes individual evaluations including discussions and generates the Draft Evaluation Forms including draft findings.



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Procedures

A Science Panel Meeting is held to refine and finalize the science evaluation forms.

- The Science Panel compiles all of the findings for each proposal.
- For each proposal, the Chair or designated Lead Evaluator leads the discussion, summarizes the proposed investigation, and documents the results.
- If warranted, the Panel may reconsider evaluations at the Meeting.
- Evaluations of all proposals are reviewed during the Science Panel Meeting to ensure that standards have been applied uniformly and in an appropriate and fair manner.
- The Lead Evaluator synthesizes and documents Panel evaluations.



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Evaluation Factors

Factors A-1 to A-6. Intrinsic Science, Exploration, or Technology Merit of the Proposed Investigation: Please refer to Section 7.2.2 of the SALMON-3 AO for details.

- Factor A-1. Compelling nature and priority of the proposed investigation's science, exploration, or technology goals and objectives.
- Factor A-2. Programmatic value of the proposed investigation.
- Factor A-3. Likelihood of science, exploration, or technology success.
- Factor A-4. Science, exploration, or technology value of the Threshold Investigation.
- Factor A-5. Merit of any Science-Exploration-Technology Enhancement Options (SEOs), if proposed.
- Factor A-6. Merit of any PI-developed Technology Demonstration Opportunities (TDOs), if proposed.



Science Evaluation

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Science Panel Evaluation Factors

Factors B-1 to B7. Experiment Science, Exploration, or Technology Implementation Merit and Feasibility of the Proposed Investigation: Please refer to Section 7.2.3 of the SALMON-3 AO for details.

- Factor B-1. Merit of the instruments and investigation design for addressing the science, exploration, or technology goals and objectives.
 - Factor B-2. Probability of technical success.
 - Factor B-3. Merit of the data analysis, data availability, and data archiving plan and/or sample analysis plan.
 - Factor B-4. Science, exploration, or technology resiliency.
 - Factor B-5. Probability of investigation team success.
 - Factor B-6. Merit of any Science-Exploration-Technology Enhancement Options (SEOs), if proposed.
 - Factor B-7. Merit of PI-developed Technology Demonstration Opportunities (TDOs), if proposed.
-



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Evaluation Findings

- **Major Strength:** A facet of the implementation response that is judged to be of superior merit and can substantially contribute to the ability of the project to meet its scientific objectives.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its scientific objectives.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of merit.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of merit.

Note: Findings that are considered “as expected” are not documented in the Forms.



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Factors A and B Rating Definitions

- **Excellent:** A comprehensive, thorough, and compelling proposal of exceptional merit that fully responds to the objectives of the AO as documented by numerous and/or significant strengths and having no major weaknesses.
- **Very Good:** A fully competent proposal of very high merit that fully responds to the objectives of the AO, whose strengths fully outbalance any weaknesses.
- **Good:** A competent proposal that represents a credible response to the AO, having neither significant strengths nor weakness and/or whose strengths and weaknesses essentially balance.
- **Fair:** A proposal that provides a nominal response to the AO, but whose weaknesses outweigh any perceived strengths.
- **Poor:** A seriously flawed proposal having one or more major weaknesses (e.g., an inadequate or flawed plan of research or lack of focus on the objectives of the AO).

Note: Only Major Findings are considered in the rating.



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Products: Form A

For each proposal, the Science evaluation will result in two forms, Forms A and B:

Form A

- Proposal title, PI name, and submitting organization;
- Proposal summary;
- The Intrinsic Science Merit of the Proposed Investigation adjectival ratings from each evaluator, ranging from “Excellent” to “Poor”;
- Summary rationale for the median rating;
- Narrative findings supporting the adjectival rating in the form of specific major or minor strengths or weaknesses;
- Comments to PI, Comments to NASA (optional)



Science Evaluation

SALMON- 3 AO
Evaluation Plan

Science Panel Products: Form B

For each proposal, the Science evaluation will result in two forms, Forms A and B:

Form B

- Proposal title, PI name, and submitting organization;
- The Experiment Science Implementation Merit and Feasibility of the Proposed Investigation adjectival ratings from each evaluator, ranging from “Excellent” to “Poor”;
- Summary rationale for the median rating;
- Narrative findings supporting the adjectival rating in the form of specific major or minor strengths or weaknesses;
- Comments to PI, Comments to NASA (optional)



TMC Evaluation



TMC Evaluation

SALMON- 3 AO
Evaluation Plan

TMC Panel Composition and Organization

The Acquisition Manager, who is a Civil Servant from the NASA Science Office for Mission Assessments (SOMA) at NASA Langley Research Center (LaRC), leads the TMC panel. NASA SOMA works directly for NASA Headquarters and is firewalled from the rest of NASA LaRC.

TMC Panel evaluators are a mix of the best non-conflicted contractors, consultants, and Civil Servants who are experts in their respective fields.

- Evaluators read their assigned proposals.
- Evaluators provide findings on their assigned proposals.
- Evaluators provide ratings of proposals that reflect the findings.

Specialist evaluators may be called upon when technical expertise is needed that is not represented in the panel. They evaluate only those parts of a proposal that are specific to their particular expertise.



TMC Evaluation

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TMC Panel Evaluation Factors

Factors C1 – C5: TMC Feasibility of the Proposed Investigation Implementation: Please refer to Section 7.2.4 of the SALMON-3 AO for details. These factors are evaluated as applicable for each proposed investigation.

- Factor C-1. Adequacy and robustness of the instrument implementation plan.
- Factor C-2. Adequacy and robustness of the investigation design and plan for operations.
- Factor C-3. Adequacy and robustness of the flight systems.
- Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team.
- Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.



TMC Evaluation

SALMON- 3 AO
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TMC Cost Analysis: Step 1 of a Single Step Competitive Process

- Initial cost analyses is accomplished on the basis of information provided in the proposals (consistency, completeness, proposed basis of estimate, contributions, use full cost accounting, maintenance of reserve levels, cost management, etc.).
- One or more cost models are utilized to validate the proposed cost.
- Implementation threats are identified.
- Cost threat impacts to the proposed unencumbered reserves are assessed (see Cost Threat Matrix slide 32). The remaining unencumbered reserves are compared to the minimum required in the PEA.
- The entire panel participates in Cost deliberations. All information from the entire evaluation process is considered in the final cost assessment.
- Cost Risk is reported as an adjectival rating, ranging from “LOW Risk” to “HIGH Risk” on a five-point scale.
- Significant findings are documented in the Cost Factor on Form C and considered in the TMC Risk Rating.



TMC Evaluation

SALMON- 3 AO
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TMC Cost Analysis: Step 1 of a Two-Step Competitive Process

- Initial cost analyses is accomplished on the basis of information provided in the proposals (consistency, completeness, proposed basis of estimate, contributions, use full cost accounting, maintenance of reserve levels, cost management, etc.).
- One or more cost models are utilized to validate the proposed cost.
- Implementation threats are identified.
- Cost threat impacts to the proposed unencumbered reserves are assessed (see Cost Threat Matrix slide 32). The remaining unencumbered reserves are compared to the minimum required in the PEA.
- The entire panel participates in Cost deliberations. All information from the entire evaluation process is considered in the final cost assessment.
- Significant findings are documented in the Cost Factor on Form C and considered in the TMC Risk Rating.



TMC Evaluation

SALMON- 3 AO
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TMC Cost Analysis: Cost Threat Matrix

- The *likelihood* and *cost impact*, if any, of each weakness is stated as “This finding represents a cost threat assessed to have an Unlikely/Possible/Likely/Very Likely/Almost Certain likelihood of a Very Minimal/Minimal/Limited/Moderate/Significant/Very Significant cost impact being realized during development and/or operations.”
- The *likelihood* is the probability range that the *cost impact* will materialize.
- The *cost impact* is the current best estimate of the range of costs to mitigate the realized threat.
- The cost threat matrix below defines the adjectives used to describe the *likelihood* and *cost impact*.
- The minimum cost threat threshold for Phases A/B/C/D and Phase E will be set at a X% or a \$Y as stated in the applicable PEA.

		Cost Impact (CI, % of PI-Managed Mission cost to complete Phases A/B/C/D or % of Phase E not including unencumbered cost reserves)					
		Very Minimal (1% < CI ≤ 2.5%)	Minimal (2.5% < CI ≤ 5%)	Limited (5% < CI ≤ 10%)	Moderate (10% < CI ≤ 15%)	Significant (15% < CI ≤ 20%)	Very Significant (CI > 20%)
Likelihood (L, %)	Almost Certain (L > 80%)						
	Very Likely (60% < L ≤ 80%)						
	Likely (40% < L ≤ 60%)						
	Possible (20% < L ≤ 40%)						
	Unlikely (L ≤ 20%)						

Note: For each proposal the percentages in the above table will be converted to dollars by the cost estimator.



TMC Evaluation

SALMON- 3 AO
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TMC Panel Evaluation Findings Definitions

- **Major Strength:** A facet of the implementation response that is judged to be well above expectations and can substantially contribute to the ability of the project to meet its technical requirements on schedule and within cost.
- **Minor Strength:** A strength that is worthy of note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.
- **Major Weakness:** A deficiency or set of deficiencies taken together that are judged to substantially weaken the project's ability to meet its technical objectives on schedule and within cost.
- **Minor Weakness:** A weakness that is sufficiently worrisome to note and can be brought to the attention of Proposers during debriefings, but is not a discriminator in the assessment of risk.

Note: Findings that are considered “as expected” are not documented in the Form C.



TMC Evaluation

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TMC Risk Ratings

Based on the narrative findings, each proposal is assigned one of three risk ratings, defined as follows:

- **LOW Risk:** There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the proposer's capability to accomplish the investigation well within the available resources.
- **MEDIUM Risk:** Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Investigation design may be complex and resources tight.
- **HIGH Risk:** One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.

Note: Only Major Findings are considered in the risk rating.



TMC Evaluation

SALMON- 3 AO
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TMC Panel Product: Form C

For each proposal, the TMC evaluation results in a Form C that contains:

- Proposal title, PI name, and submitting organization;
- The TMC Feasibility of the Proposed Investigation Implementation adjectival risk rating from each evaluator of “LOW Risk”, “MEDIUM Risk” or “HIGH Risk”;
- Summary rationale for the median risk rating;
- Narrative findings supporting the adjectival risk rating in the form of specific major or minor strengths or weaknesses;
- Comments to the PI, Comments to the Selection Official (optional)



Categorization



Categorization

Categorization Process and Proposal Categories

Upon completion of the evaluations, the results are presented to the Categorization Committee, composed wholly of Civil Servants and Intergovernmental Personnel Act appointees (some of whom may be from Government agencies other than NASA) and appointed by the Associate Administrator(s) for the appropriate Mission Directorate(s).

The Categorization Committee considers the evaluation results and, based on the evaluations, categorize the proposals in accordance with procedures required by NFS 1872.403-1(e). The categories are defined as:

- Category I. Well-conceived, meritorious, and feasible investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that data can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.



Categorization

SALMON- 3 AO
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Categorization Process and Proposal Categories

- Category II. Well-conceived, meritorious, and feasible investigations that are recommended for acceptance, but at a lower priority than Category I, whatever the reason.
- Category III. Meritorious investigations that require further development. Category III investigations may be funded for further development and may be reconsidered at a later time for the same or other opportunities.
- Category IV. Proposed investigations that are recommended for rejection for the particular opportunity under consideration, whatever the reason.



Categorization

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Evaluation Conclusion and AO Steering Committee

- Once Categorization has been completed, the Evaluation is considered complete unless any issue is questioned by a subsequent AO Steering Committee review.
- The AO Steering Committee will conduct an independent assessment of the evaluation and categorization processes regarding their compliance to established policies and practices, as well as the completeness, self- consistency, and adequacy of all supporting materials.



Selection



Selection

Selection Factors

The results of the proposal evaluations based on the criteria described in the SALMON-3 AO and the applicable PEA and the categorizations will be considered in the selection process.

The Selection Official(s) may take into account a wide range of programmatic factors in deciding whether or not to select any proposals and in selecting among top-rated proposals, including, but not limited to, planning and policy considerations, available funding, programmatic merit and risk of any proposed partnerships, and maintaining a programmatic balance across the mission directorate(s). While NASA develops and evaluates its program strategy in close consultation with the NASA community through a wide variety of advisory groups, NASA programs are evolving activities that ultimately depend upon the most current Administration policies and budgets, as well as programs' objectives and priorities that can change quickly based on, among other things, new discoveries from ongoing missions.



Approval

SALMON- 3 AO
Evaluation Plan

Dr. Cindy L. Daniels
Director
NASA Science Office for Mission Assessments

Dr. Michael New
Deputy Associate Administrator for Research
NASA Science Mission Directorate

Signed copy on file



2019 Astrophysics Explorers Program Element Appendix O

Evaluation Plan

Draft

May 7, 2019



Introduction

This Evaluation Plan, together with the SALMON-3 AO NASA SMD Evaluation Plan is a general guide to the evaluation of proposals submitted as a result of the 2019 Astrophysics Explorers PEA O solicitation. This Evaluation Plan is the companion to the overall SALMON-3 AO NASA SMD Evaluation Plan, covers evaluation information directly from the PEA O, and points out areas where there are differences between the SALMON-3 AO and PEA O. These differences may include proposal requirements and evaluation criteria.

In the case of differences between the SALMON-3 AO and the 2019 Astrophysics PEA O, and their respective evaluation plans, the 2019 Astrophysics Explorers PEA O language takes precedence.

The 2019 Astrophysics Explorers PEA O only solicits “science” investigations, so wherever the phrase “Science, Exploration, or Technology” appears in the AO or Evaluation Plan, it should be interpreted to only indicate “Science.” Science Evaluation Factors A-6 and B-7 will not be evaluated under this Solicitation.

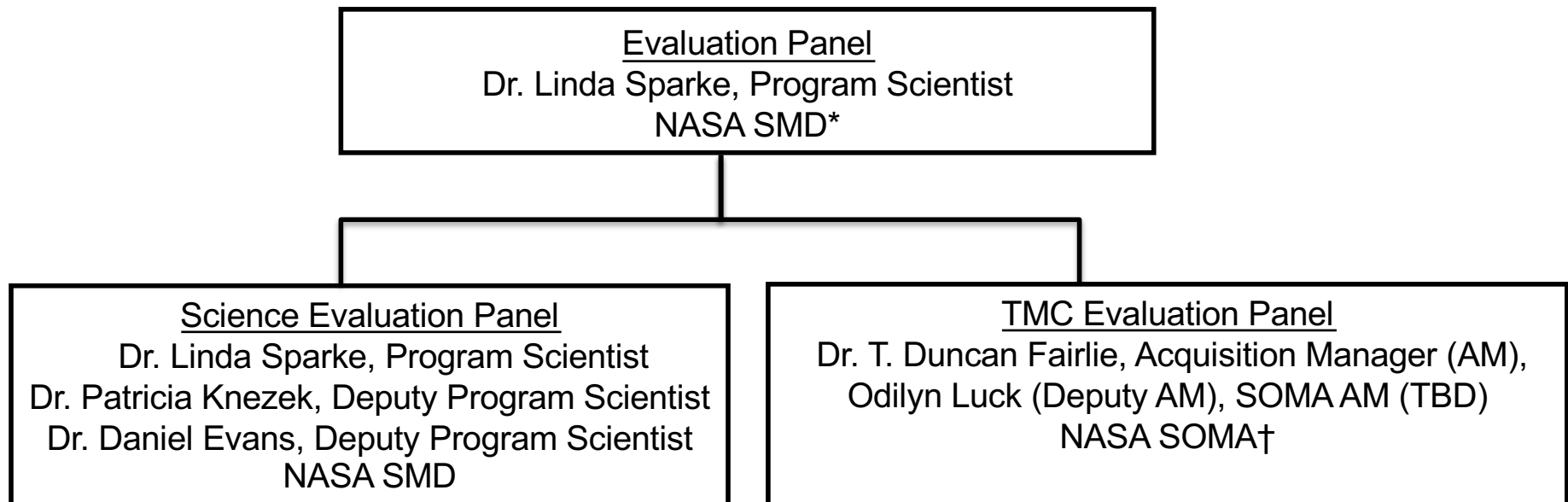
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Evaluation Panel Organization

Astrophysics
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Evaluation Panel Organization



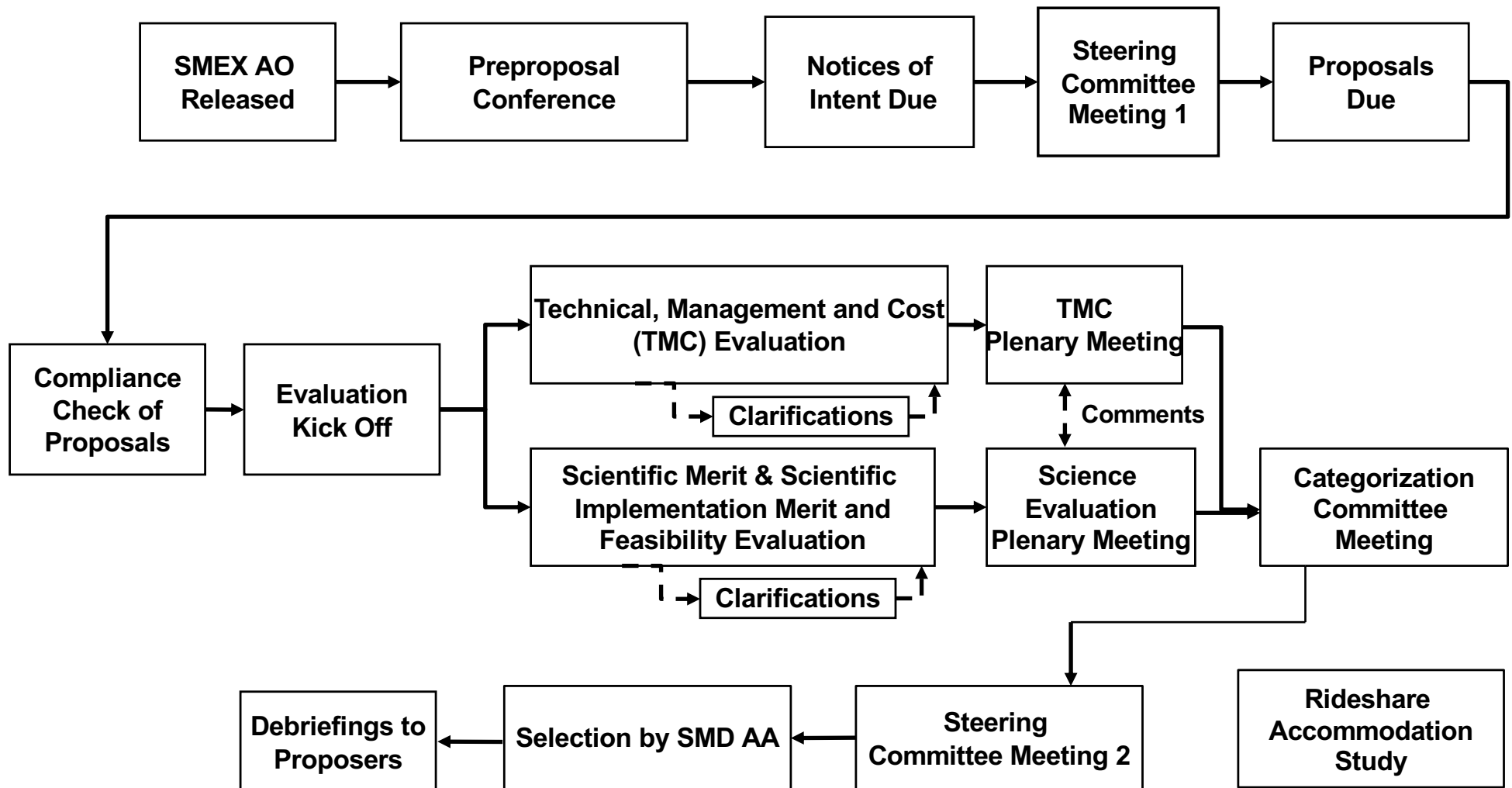
* Science Mission Directorate

† Science Office for Mission Assessments



Proposal Evaluation Flow

Astrophysics
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Evaluation Plan





Scientific/Technical Evaluation

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- Proposals will be evaluated according to the evaluation criteria set forth in Section 7.2 of the SALMON-3 AO, with the exceptions of Factor B-5 and Factor C-4 for Streamlined Class D missions, which are amended to delete evaluation of the PI's spaceflight experience.
 - In Factor B-5, the scientific expertise of the PI will be evaluated but not his/her experience with NASA missions. Comments about the managerial experience of the PI, and whether appropriate mentoring and support tools are in place, will be made to the Selecting Official but these comments shall not impact the "Investigation Implementation Merit" rating.
 - In Factor C-4, the capability of the management team will be evaluated as a whole, as opposed to assessing the capabilities of each of the Key Team Members independently. Comments about the managerial experience of the PI, and whether appropriate mentoring and support tools are in place, will be made to the Selecting Official but these comments shall not impact the "Technical, Management, and Cost Feasibility" rating.



Scientific/Technical Evaluation

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- The wording of Factor B-3 set forth in Section 7.2 of the SALMON-3 AO is amended to delete mention of returned samples, to read:
 - Merit of the data analysis, data availability, and data archiving plan. This factor includes the merit of plans for data analysis and data archiving to meet the goals and objectives of the investigation; to result in the publication of science discoveries in the professional literature; and to preserve data and analysis of value to the science community. Considerations in this factor include assessment of planning and budget adequacy and evidence of plans for well-documented, high-level data products and software usable to the entire science community; assessment of adequate resources for physical interpretation of data; reporting scientific results in the professional literature (e.g., refereed journals); and assessment of the proposed plan for the timely release of the data to the public domain for enlarging its science impact.
- No information on Science Enhancement Options (SEOs) is needed for the Step-1 proposal. Instead, plans and costs for proposed SEO activities must be defined in the Step 2 Concept Study Report. Factors A-5 and B-6 (Section 7.2 of the SALMON-3 AO) will not contribute to the adjectival ratings for Intrinsic Science Merit and Experiment Science Implementation Merit for the Step 1 proposal.



Scientific/Technical Evaluation

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- The panel evaluating the third evaluation criterion, TMC Feasibility of the Proposed Investigation Implementation, will also provide comments to NASA regarding the extent to which proposed ESPA rideshare investigations are compatible with potential launch opportunities. These comments will not be considered for the TMC Feasibility of the Proposed Investigation Implementation evaluation.

After the evaluation, but prior to the selection decision, NASA will perform an accommodation study of selectable ESPA rideshare investigation proposals to assess the extent to which the proposed investigations are compatible with potential ESPA interfaces and operations. This accommodation study will also consider the accommodations of selectable ESPA proposals for launch.

After the evaluation, but prior to the selection decision, NASA will perform an accommodation study of selectable cislunar rideshare investigation proposals to assess the extent to which the proposed investigations are compatible with potential cislunar rideshare interfaces and operations. This accommodation study will also consider the accommodations of selectable cislunar proposals for launch.

- Half-step ratings for the Intrinsic Science Merit and Experiment Science Implementation Merit and Feasibility criteria will be used.



Scientific/Technical Evaluation

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- Streamlined Class D - Additional Tailoring
 - From PEA Section 5.3.3: Streamlined Class-D Investigations must identify the tailoring requirements not specifically identified as being waived in the *NASA Science Mission Directorate (SMD) Class-D Tailoring/Streamlining Decision Memorandum* and described in NPR 7120.5E that are proposed for adjustment, provide a rationale for each adjustment, and describe any cost or schedule impacts that would occur should the adjustments be rejected by NASA.
 - Investigations in other risk classes (i.e., A, B, or C) may also contain proposed adjustments to NASA requirements. Proposers must identify the tailorable requirements described in NPR 7120.5E that are being adjusted, provide a rationale for each adjustment, and describe any cost or schedule impacts that would occur should the adjustments be rejected by NASA.
 - The panel evaluating the third evaluation criterion, TMC Feasibility of the Proposed Investigation Implementation, will provide comments to the Selection Official on the proposed adjustments and their justifications. These comments will not be considered for the TMC Feasibility of the Proposed Investigation Implementation risk rating but may be considered in the selection decision.



Clarification Process for Potential Major Weaknesses

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NASA will request clarifications of Potential Major Weaknesses (PMWs) identified by the evaluation panels in all three criteria; Intrinsic Science Merit of the Proposed Investigation, Experiment Science Implementation Merit and Feasibility of the Proposed Investigation, and TMC Feasibility of the Proposed Investigation Implementation. NASA will request such clarification uniformly, from all proposers.

- All requests for clarification from NASA and the proposers' responses are in writing.
- The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not intend to enter into discussions with proposers.
- PIs whose proposals have no PMWs are informed that no PMWs have been identified at that time.
- The form of the clarifications is strictly limited to a few types of responses:
 - Identification of the locations in the proposal (page(s), section(s), line(s)) where the PMW is addressed.
 - Noting that the PMW is not addressed in the proposal.
 - Stating that the PMW is invalidated by information that is common knowledge and is therefore not included in the proposal. Stating that the analysis leading to the PMW is incorrect and identifying a place in the proposal where data supporting a correct analysis may be found.
 - Stating that a typographical error appears in the proposal and that the correct data is available elsewhere inside of the proposal.

The PIs are given at least 24 hours to respond to the request for PMW clarification. Any response that goes beyond the five forms of clarification stated above will be deleted and not shown to the evaluation panel.



TMC Evaluation (replaces chart #31)

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TMC Cost Analysis: Step 1 of a Two-Step Competitive Process

- Initial cost analysis is accomplished on the basis of information provided in the proposals (consistency, completeness, proposed basis of estimate, contributions, use full cost accounting, maintenance of reserve levels, cost management, etc.).
- One or more cost models are utilized to validate the proposed cost.
- Implementation threats are identified.
- Cost threat impacts to the proposed unencumbered reserves are assessed (see Cost Threat Matrix slide # 53). The remaining unencumbered reserves are compared to the minimum required in the PEA.
- The entire panel participates in Cost deliberations. All information from the entire evaluation process is considered in the final cost assessment.
- Significant findings are documented in the Cost Factor on Form C.



Cost Threat Matrix

- "The *likelihood* and *cost impact*, if any, of each weakness is stated as "This finding represents a cost threat assessed to have an Unlikely/Possible/Likely/Very Likely/Almost Certain likelihood of a Minimal/Limited/Moderate/Significant/Very Significant cost impact being realized during development and/or operations."
- "The *likelihood* is the probability range that the *cost impact* will materialize.
- "The *cost impact* is the current best estimate of the range of costs to mitigate the realized threat.
- The cost threat matrix below defines the adjectives used to describe the *likelihood* and *cost impact*.
- Minimum cost threat threshold for Phase E is set at \$250K.

		Cost Impact (CI, % of PI-Managed Investigation cost to complete Phases A/B/C/D (not including launch) or Phase E ,not including unencumbered cost reserves)				
		Minimal (2.5%* < CI ≤ 5%)	Limited (5% < CI ≤ 10%)	Moderate (10% < CI ≤ 15%)	Significant (15% < CI ≤ 20%)	Very Significant (CI > 20%)
Likelihood (L, %)	Almost Certain (L > 80%)					
	Very Likely (60% < L ≤ 80%)					
	Likely (40% < L ≤ 60%)					
	Possible (20% < L ≤ 40%)					
	Unlikely (L ≤ 20%)					

* 2.5% for Phases A/B/C/D,
or \$250K for Phase E

Note: For each proposal the percentages in the above table will be converted to dollars by the cost estimator.



Exceptions to SALMON-3

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- The following content in the SALMON-3 Section is modified or excluded from the 2019 Astro MO PEA O evaluation.
 - » Chart # 21: Factor A-6 will not be evaluated under this Solicitation
 - » Chart # 22: Factor B-7 will not be evaluated under this Solicitation
 - » Chart # 30 is not applicable because this Solicitation is Step 1 of a Two-Step competitive process.
 - » Chart # 31 is replaced by Chart # 52 (above)



Forms A, B & C Grades

- **Forms A & B Grades:** Polling will be held twice on the Form A and B grades. The individual grades from the final polling are recorded and reported. The final grade is set equal to median of the final polling. A median score that falls between two grades will be “rounded” in the direction of the mean score; if the mean and median are equal, the score will be “rounded” towards the less favorable grade. If there is a divergence of opinion, there may be additional rounds of discussion and polling.
- **Form C Grade:** Form C will be reviewed three times. Polling will be held twice on the Form C risk rating. The final polling is recorded and reported. For the final polling, the individual grades are recorded, the median calculated and the final grade recorded which reflects the Form C Risk rating of the median of the polling. A median score that falls between two risk ratings will be “rounded” to the higher risk rating. If there is a divergence of opinion, there may be additional rounds of discussion and polling.



Approval

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